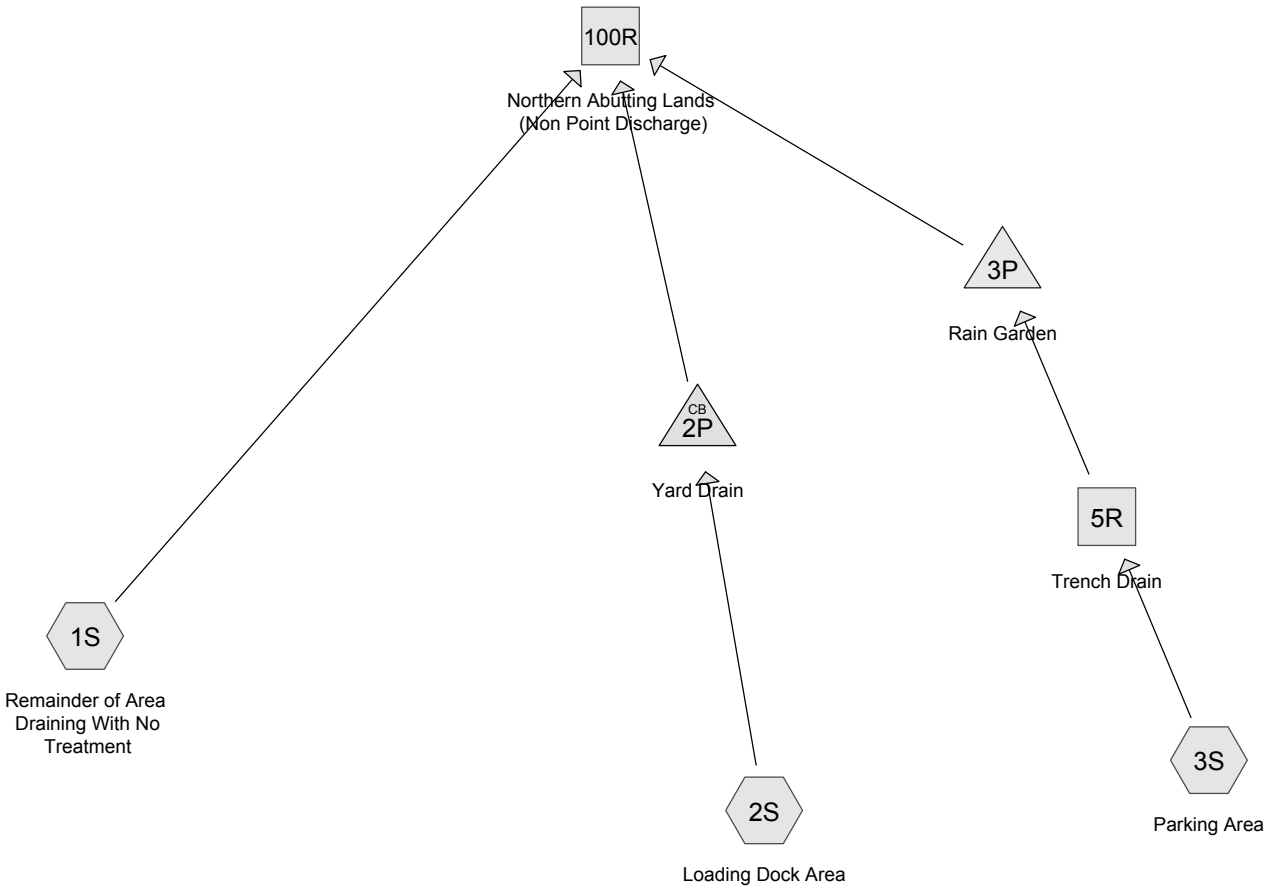

Subcat Reach Pond Link

Routing Diagram for Associate Buyers Proposed Model 5-28-13
Prepared by Berry Surveying & Engineering, Printed 5/29/2013

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.188	74	>75% Grass cover, Good, HSG C (3S)
0.506	74	>75% Grass cover, Good, HSG C Rain Garden (1S)
0.618	98	Paved parking, HSG C (2S, 3S)
0.522	98	Roof (1S)
0.263	70	Woods, Good, HSG C (1S)
0.071	82	Woods/grass comb., Poor, HSG C (3S)
2.168	**86**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
1.646	HSG C	1S, 2S, 3S
0.000	HSG D	
0.522	Other	1S
2.168		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.694	0.000	0.000	0.694	>75% Grass cover, Good	1S, 3S
0.000	0.000	0.618	0.000	0.000	0.618	Paved parking	2S, 3S
0.000	0.000	0.000	0.000	0.522	0.522	Roof	1S
0.000	0.000	0.263	0.000	0.000	0.263	Woods, Good	1S
0.000	0.000	0.071	0.000	0.000	0.071	Woods/grass comb., Poor	3S
0.000	**0.000**	**1.646**	**0.000**	**0.522**	**2.168**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	2P	168.80	168.50	108.0	0.0028	0.012	12.0	0.0	0.0
2	3P	167.50	167.25	86.0	0.0029	0.012	4.0	0.0	0.0

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Remainder of Area Runoff Area=56,252 sf 40.45% Impervious Runoff Depth>1.34"
Flow Length=245' Tc=2.6 min CN=83 Runoff=2.39 cfs 0.145 af

Subcatchment2S: Loading Dock Area Runoff Area=5,215 sf 100.00% Impervious Runoff Depth>2.59"
Flow Length=117' Tc=0.9 min CN=98 Runoff=0.39 cfs 0.026 af

Subcatchment3S: Parking Area Runoff Area=32,967 sf 65.86% Impervious Runoff Depth>1.95"
Flow Length=71' Tc=3.8 min CN=91 Runoff=1.92 cfs 0.123 af

Reach 5R: Trench Drain Avg. Flow Depth=0.39' Max Vel=3.24 fps Inflow=1.92 cfs 0.123 af
n=0.013 L=100.0' S=0.0050 '/' Capacity=4.73 cfs Outflow=1.90 cfs 0.123 af

Reach 100R: Northern Abutting Lands (Non Point Discharge) Inflow=3.07 cfs 0.293 af
Outflow=3.07 cfs 0.293 af

Pond 2P: Yard Drain Peak Elev=169.19' Inflow=0.39 cfs 0.026 af
12.0" Round Culvert n=0.012 L=108.0' S=0.0028 '/' Outflow=0.39 cfs 0.026 af

Pond 3P: Rain Garden Peak Elev=170.35' Storage=1,546 cf Inflow=1.90 cfs 0.123 af
Outflow=0.62 cfs 0.122 af

Total Runoff Area = 2.168 ac Runoff Volume = 0.293 af Average Runoff Depth = 1.62"
47.39% Pervious = 1.027 ac 52.61% Impervious = 1.141 ac

Summary for Subcatchment 1S: Remainder of Area Draining With No Treatment

Runoff = 2.39 cfs @ 12.05 hrs, Volume= 0.145 af, Depth> 1.34"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

	Area (sf)	CN	Description
*	22,755	98	Roof
	11,459	70	Woods, Good, HSG C
*	22,038	74	>75% Grass cover, Good, HSG C Rain Garden
	56,252	83	Weighted Average
	33,497		59.55% Pervious Area
	22,755		40.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	100	0.4200	4.50		**Sheet Flow, 1** Smooth surfaces n= 0.011 P2= 3.00"
2.2	145	0.0255	1.12		**Shallow Concentrated Flow, 2** Short Grass Pasture Kv= 7.0 fps
2.6	245	Total			

Summary for Subcatchment 2S: Loading Dock Area

Runoff = 0.39 cfs @ 12.01 hrs, Volume= 0.026 af, Depth> 2.59"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
5,215	98	Paved parking, HSG C
5,215		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0300	1.36		**Sheet Flow, 1** Smooth surfaces n= 0.011 P2= 3.00"
0.3	67	0.0270	3.34		**Shallow Concentrated Flow, 2** Paved Kv= 20.3 fps
0.9	117	Total			

Summary for Subcatchment 3S: Parking Area

Runoff = 1.92 cfs @ 12.06 hrs, Volume= 0.123 af, Depth> 1.95"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 2-Year Rainfall=3.00"

Area (sf)	CN	Description
21,711	98	Paved parking, HSG C
3,083	82	Woods/grass comb., Poor, HSG C
8,173	74	>75% Grass cover, Good, HSG C
32,967	91	Weighted Average
11,256		34.14% Pervious Area
21,711		65.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	12	0.0200	0.87		**Sheet Flow, 1** Smooth surfaces n= 0.011 P2= 3.00"
3.6	59	0.0930	0.27		**Sheet Flow, 2** Grass: Short n= 0.150 P2= 3.00"
3.8	71	Total			

Summary for Reach 5R: Trench Drain

Inflow Area = 0.757 ac, 65.86% Impervious, Inflow Depth > 1.95" for 2-Year event
Inflow = 1.92 cfs @ 12.06 hrs, Volume= 0.123 af
Outflow = 1.90 cfs @ 12.06 hrs, Volume= 0.123 af, Atten= 1%, Lag= 0.4 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.24 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 0.95 fps, Avg. Travel Time= 1.8 min

Peak Storage= 58 cf @ 12.06 hrs
Average Depth at Peak Storage= 0.39'
Bank-Full Depth= 0.75' Flow Area= 1.1 sf, Capacity= 4.73 cfs

1.50' x 0.75' deep channel, n= 0.013
Length= 100.0' Slope= 0.0050 '/'
Inlet Invert= 170.57', Outlet Invert= 170.07'

Summary for Reach 100R: Northern Abutting Lands (Non Point Discharge)

Inflow Area = 2.168 ac, 52.61% Impervious, Inflow Depth > 1.62" for 2-Year event
Inflow = 3.07 cfs @ 12.04 hrs, Volume= 0.293 af
Outflow = 3.07 cfs @ 12.04 hrs, Volume= 0.293 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Pond 2P: Yard Drain

Inflow Area = 0.120 ac,100.00% Impervious, Inflow Depth > 2.59" for 2-Year event
Inflow = 0.39 cfs @ 12.01 hrs, Volume= 0.026 af
Outflow = 0.39 cfs @ 12.01 hrs, Volume= 0.026 af, Atten= 0%, Lag= 0.0 min
Primary = 0.39 cfs @ 12.01 hrs, Volume= 0.026 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 169.19' @ 12.01 hrs
Flood Elev= 170.15'

Device	Routing	Invert	Outlet Devices
#1	Primary	168.80'	**12.0" Round Culvert** L= 108.0' Ke= 0.300 Inlet / Outlet Invert= 168.80' / 168.50' S= 0.0028 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.37 cfs @ 12.01 hrs HW=169.18' TW=0.00' (Dynamic Tailwater)
↑**1=Culvert** (Barrel Controls 0.37 cfs @ 2.01 fps)

Summary for Pond 3P: Rain Garden

Inflow Area = 0.757 ac, 65.86% Impervious, Inflow Depth > 1.95" for 2-Year event
Inflow = 1.90 cfs @ 12.06 hrs, Volume= 0.123 af
Outflow = 0.62 cfs @ 12.35 hrs, Volume= 0.122 af, Atten= 67%, Lag= 17.4 min
Primary = 0.62 cfs @ 12.35 hrs, Volume= 0.122 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 170.35' @ 12.35 hrs Surf.Area= 5,179 sf Storage= 1,546 cf

Plug-Flow detention time= 33.2 min calculated for 0.122 af (99% of inflow)
Center-of-Mass det. time= 31.0 min (802.9 - 772.0)

Volume	Invert	Avail.Storage	Storage Description
#1	167.50'	177 cf	**5.00'W x 90.00'L x 1.00'H Stone Bed** 450 cf Overall - 8 cf Embedded = 442 cf x 40.0% Voids
#2	167.50'	8 cf	**4.0" D x 90.0'L Pipe Storage** Inside #1
#3	168.50'	363 cf	**Bio Media (Prismatic)** Listed below (Recalc) 2,418 cf Overall x 15.0% Voids
#4	170.00'	3,340 cf	**Open Pond Area (Irregular)** Listed below (Recalc)
		3,888 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
168.50	1,612	0	0
170.00	1,612	2,418	2,418

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
170.00	2,669	241.0	0	0	2,669
171.00	4,060	341.0	3,340	3,340	7,310

Device	Routing	Invert	Outlet Devices
#1	Primary	170.30'	**12.0' long x 4.0' breadth E. Spill Way** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Primary	167.50'	**4.0" Round 4" Outlet** L= 86.0' Ke= 0.500 Inlet / Outlet Invert= 167.50' / 167.25' S= 0.0029 '/' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=0.62 cfs @ 12.35 hrs HW=170.35' TW=0.00' (Dynamic Tailwater)
1=E. Spill Way (Weir Controls 0.28 cfs @ 0.51 fps)
2=4" Outlet (Barrel Controls 0.34 cfs @ 3.94 fps)

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Remainder of Area Runoff Area=56,252 sf 40.45% Impervious Runoff Depth>2.39"
Flow Length=245' Tc=2.6 min CN=83 Runoff=4.22 cfs 0.257 af

Subcatchment2S: Loading Dock Area Runoff Area=5,215 sf 100.00% Impervious Runoff Depth>3.78"
Flow Length=117' Tc=0.9 min CN=98 Runoff=0.56 cfs 0.038 af

Subcatchment3S: Parking Area Runoff Area=32,967 sf 65.86% Impervious Runoff Depth>3.12"
Flow Length=71' Tc=3.8 min CN=91 Runoff=3.00 cfs 0.197 af

Reach 5R: Trench Drain Avg. Flow Depth=0.53' Max Vel=3.70 fps Inflow=3.00 cfs 0.197 af
n=0.013 L=100.0' S=0.0050 '/' Capacity=4.73 cfs Outflow=2.97 cfs 0.197 af

Reach 100R: Northern Abutting Lands (Non Point Discharge) Inflow=5.38 cfs 0.491 af
Outflow=5.38 cfs 0.491 af

Pond 2P: Yard Drain Peak Elev=169.27' Inflow=0.56 cfs 0.038 af
12.0" Round Culvert n=0.012 L=108.0' S=0.0028 '/' Outflow=0.56 cfs 0.038 af

Pond 3P: Rain Garden Peak Elev=170.45' Storage=1,889 cf Inflow=2.97 cfs 0.197 af
Outflow=2.06 cfs 0.196 af

Total Runoff Area = 2.168 ac Runoff Volume = 0.491 af Average Runoff Depth = 2.72"
47.39% Pervious = 1.027 ac 52.61% Impervious = 1.141 ac

Summary for Subcatchment 1S: Remainder of Area Draining With No Treatment

Runoff = 4.22 cfs @ 12.05 hrs, Volume= 0.257 af, Depth> 2.39"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.30"

	Area (sf)	CN	Description
*	22,755	98	Roof
	11,459	70	Woods, Good, HSG C
*	22,038	74	>75% Grass cover, Good, HSG C Rain Garden
	56,252	83	Weighted Average
	33,497		59.55% Pervious Area
	22,755		40.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	100	0.4200	4.50		**Sheet Flow, 1** Smooth surfaces n= 0.011 P2= 3.00"
2.2	145	0.0255	1.12		**Shallow Concentrated Flow, 2** Short Grass Pasture Kv= 7.0 fps
2.6	245	Total			

Summary for Subcatchment 2S: Loading Dock Area

Runoff = 0.56 cfs @ 12.01 hrs, Volume= 0.038 af, Depth> 3.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.30"

Area (sf)	CN	Description
5,215	98	Paved parking, HSG C
5,215		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0300	1.36		**Sheet Flow, 1** Smooth surfaces n= 0.011 P2= 3.00"
0.3	67	0.0270	3.34		**Shallow Concentrated Flow, 2** Paved Kv= 20.3 fps
0.9	117	Total			

Summary for Subcatchment 3S: Parking Area

Runoff = 3.00 cfs @ 12.06 hrs, Volume= 0.197 af, Depth> 3.12"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 10-Year Rainfall=4.30"

Area (sf)	CN	Description
21,711	98	Paved parking, HSG C
3,083	82	Woods/grass comb., Poor, HSG C
8,173	74	>75% Grass cover, Good, HSG C
32,967	91	Weighted Average
11,256		34.14% Pervious Area
21,711		65.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	12	0.0200	0.87		**Sheet Flow, 1** Smooth surfaces n= 0.011 P2= 3.00"
3.6	59	0.0930	0.27		**Sheet Flow, 2** Grass: Short n= 0.150 P2= 3.00"
3.8	71	Total			

Summary for Reach 5R: Trench Drain

Inflow Area = 0.757 ac, 65.86% Impervious, Inflow Depth > 3.12" for 10-Year event
Inflow = 3.00 cfs @ 12.06 hrs, Volume= 0.197 af
Outflow = 2.97 cfs @ 12.06 hrs, Volume= 0.197 af, Atten= 1%, Lag= 0.4 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.70 fps, Min. Travel Time= 0.5 min
Avg. Velocity = 1.11 fps, Avg. Travel Time= 1.5 min

Peak Storage= 80 cf @ 12.06 hrs
Average Depth at Peak Storage= 0.53'
Bank-Full Depth= 0.75' Flow Area= 1.1 sf, Capacity= 4.73 cfs

1.50' x 0.75' deep channel, n= 0.013
Length= 100.0' Slope= 0.0050 '/'
Inlet Invert= 170.57', Outlet Invert= 170.07'

Summary for Reach 100R: Northern Abutting Lands (Non Point Discharge)

Inflow Area = 2.168 ac, 52.61% Impervious, Inflow Depth > 2.72" for 10-Year event
Inflow = 5.38 cfs @ 12.07 hrs, Volume= 0.491 af
Outflow = 5.38 cfs @ 12.07 hrs, Volume= 0.491 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Pond 2P: Yard Drain

Inflow Area = 0.120 ac,100.00% Impervious, Inflow Depth > 3.78" for 10-Year event
Inflow = 0.56 cfs @ 12.01 hrs, Volume= 0.038 af
Outflow = 0.56 cfs @ 12.01 hrs, Volume= 0.038 af, Atten= 0%, Lag= 0.0 min
Primary = 0.56 cfs @ 12.01 hrs, Volume= 0.038 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 169.27' @ 12.01 hrs
Flood Elev= 170.15'

Device	Routing	Invert	Outlet Devices
#1	Primary	168.80'	**12.0" Round Culvert** L= 108.0' Ke= 0.300 Inlet / Outlet Invert= 168.80' / 168.50' S= 0.0028 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.54 cfs @ 12.01 hrs HW=169.26' TW=0.00' (Dynamic Tailwater)
↑**1=Culvert** (Barrel Controls 0.54 cfs @ 2.23 fps)

Summary for Pond 3P: Rain Garden

Inflow Area = 0.757 ac, 65.86% Impervious, Inflow Depth > 3.12" for 10-Year event
Inflow = 2.97 cfs @ 12.06 hrs, Volume= 0.197 af
Outflow = 2.06 cfs @ 12.15 hrs, Volume= 0.196 af, Atten= 31%, Lag= 5.3 min
Primary = 2.06 cfs @ 12.15 hrs, Volume= 0.196 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 170.45' @ 12.15 hrs Surf.Area= 5,325 sf Storage= 1,889 cf

Plug-Flow detention time= 29.0 min calculated for 0.195 af (99% of inflow)
Center-of-Mass det. time= 27.1 min (787.9 - 760.8)

Volume	Invert	Avail.Storage	Storage Description
#1	167.50'	177 cf	**5.00'W x 90.00'L x 1.00'H Stone Bed** 450 cf Overall - 8 cf Embedded = 442 cf x 40.0% Voids
#2	167.50'	8 cf	**4.0" D x 90.0'L Pipe Storage** Inside #1
#3	168.50'	363 cf	**Bio Media (Prismatic)** Listed below (Recalc) 2,418 cf Overall x 15.0% Voids
#4	170.00'	3,340 cf	**Open Pond Area (Irregular)** Listed below (Recalc)
		3,888 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
168.50	1,612	0	0
170.00	1,612	2,418	2,418

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
170.00	2,669	241.0	0	0	2,669
171.00	4,060	341.0	3,340	3,340	7,310

Device	Routing	Invert	Outlet Devices
#1	Primary	170.30'	**12.0' long x 4.0' breadth E. Spill Way** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Primary	167.50'	**4.0" Round 4" Outlet** L= 86.0' Ke= 0.500 Inlet / Outlet Invert= 167.50' / 167.25' S= 0.0029 '/' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=2.06 cfs @ 12.15 hrs HW=170.45' TW=0.00' (Dynamic Tailwater)
1=E. Spill Way (Weir Controls 1.71 cfs @ 0.93 fps)
2=4" Outlet (Barrel Controls 0.35 cfs @ 4.02 fps)

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Remainder of Area Runoff Area=56,252 sf 40.45% Impervious Runoff Depth>3.07"
Flow Length=245' Tc=2.6 min CN=83 Runoff=5.37 cfs 0.330 af

Subcatchment2S: Loading Dock Area Runoff Area=5,215 sf 100.00% Impervious Runoff Depth>4.51"
Flow Length=117' Tc=0.9 min CN=98 Runoff=0.67 cfs 0.045 af

Subcatchment3S: Parking Area Runoff Area=32,967 sf 65.86% Impervious Runoff Depth>3.86"
Flow Length=71' Tc=3.8 min CN=91 Runoff=3.66 cfs 0.243 af

Reach 5R: Trench Drain Avg. Flow Depth=0.62' Max Vel=3.91 fps Inflow=3.66 cfs 0.243 af
n=0.013 L=100.0' S=0.0050 '/' Capacity=4.73 cfs Outflow=3.63 cfs 0.243 af

Reach 100R: Northern Abutting Lands (Non Point Discharge) Inflow=7.99 cfs 0.617 af
Outflow=7.99 cfs 0.617 af

Pond 2P: Yard Drain Peak Elev=169.32' Inflow=0.67 cfs 0.045 af
12.0" Round Culvert n=0.012 L=108.0' S=0.0028 '/' Outflow=0.67 cfs 0.045 af

Pond 3P: Rain Garden Peak Elev=170.50' Storage=2,060 cf Inflow=3.63 cfs 0.243 af
Outflow=2.99 cfs 0.242 af

Total Runoff Area = 2.168 ac Runoff Volume = 0.618 af Average Runoff Depth = 3.42"
47.39% Pervious = 1.027 ac 52.61% Impervious = 1.141 ac

Summary for Subcatchment 1S: Remainder of Area Draining With No Treatment

Runoff = 5.37 cfs @ 12.04 hrs, Volume= 0.330 af, Depth> 3.07"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.10"

	Area (sf)	CN	Description
*	22,755	98	Roof
	11,459	70	Woods, Good, HSG C
*	22,038	74	>75% Grass cover, Good, HSG C Rain Garden
	56,252	83	Weighted Average
	33,497		59.55% Pervious Area
	22,755		40.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	100	0.4200	4.50		**Sheet Flow, 1** Smooth surfaces n= 0.011 P2= 3.00"
2.2	145	0.0255	1.12		**Shallow Concentrated Flow, 2** Short Grass Pasture Kv= 7.0 fps
2.6	245	Total			

Summary for Subcatchment 2S: Loading Dock Area

Runoff = 0.67 cfs @ 12.01 hrs, Volume= 0.045 af, Depth> 4.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.10"

	Area (sf)	CN	Description
	5,215	98	Paved parking, HSG C
	5,215		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0300	1.36		**Sheet Flow, 1** Smooth surfaces n= 0.011 P2= 3.00"
0.3	67	0.0270	3.34		**Shallow Concentrated Flow, 2** Paved Kv= 20.3 fps
0.9	117	Total			

Summary for Subcatchment 3S: Parking Area

Runoff = 3.66 cfs @ 12.06 hrs, Volume= 0.243 af, Depth> 3.86"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 25-Year Rainfall=5.10"

Area (sf)	CN	Description
21,711	98	Paved parking, HSG C
3,083	82	Woods/grass comb., Poor, HSG C
8,173	74	>75% Grass cover, Good, HSG C
32,967	91	Weighted Average
11,256		34.14% Pervious Area
21,711		65.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	12	0.0200	0.87		**Sheet Flow, 1** Smooth surfaces n= 0.011 P2= 3.00"
3.6	59	0.0930	0.27		**Sheet Flow, 2** Grass: Short n= 0.150 P2= 3.00"
3.8	71	Total			

Summary for Reach 5R: Trench Drain

Inflow Area = 0.757 ac, 65.86% Impervious, Inflow Depth > 3.86" for 25-Year event
Inflow = 3.66 cfs @ 12.06 hrs, Volume= 0.243 af
Outflow = 3.63 cfs @ 12.06 hrs, Volume= 0.243 af, Atten= 1%, Lag= 0.3 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 3.91 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.22 fps, Avg. Travel Time= 1.4 min

Peak Storage= 93 cf @ 12.06 hrs
Average Depth at Peak Storage= 0.62'
Bank-Full Depth= 0.75' Flow Area= 1.1 sf, Capacity= 4.73 cfs

1.50' x 0.75' deep channel, n= 0.013
Length= 100.0' Slope= 0.0050 '/'
Inlet Invert= 170.57', Outlet Invert= 170.07'

Summary for Reach 100R: Northern Abutting Lands (Non Point Discharge)

Inflow Area = 2.168 ac, 52.61% Impervious, Inflow Depth > 3.42" for 25-Year event
Inflow = 7.99 cfs @ 12.06 hrs, Volume= 0.617 af
Outflow = 7.99 cfs @ 12.06 hrs, Volume= 0.617 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Pond 2P: Yard Drain

Inflow Area = 0.120 ac,100.00% Impervious, Inflow Depth > 4.51" for 25-Year event
Inflow = 0.67 cfs @ 12.01 hrs, Volume= 0.045 af
Outflow = 0.67 cfs @ 12.01 hrs, Volume= 0.045 af, Atten= 0%, Lag= 0.0 min
Primary = 0.67 cfs @ 12.01 hrs, Volume= 0.045 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 169.32' @ 12.01 hrs
Flood Elev= 170.15'

Device	Routing	Invert	Outlet Devices
#1	Primary	168.80'	**12.0" Round Culvert** L= 108.0' Ke= 0.300 Inlet / Outlet Invert= 168.80' / 168.50' S= 0.0028 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.64 cfs @ 12.01 hrs HW=169.31' TW=0.00' (Dynamic Tailwater)
↑**1=Culvert** (Barrel Controls 0.64 cfs @ 2.34 fps)

Summary for Pond 3P: Rain Garden

Inflow Area = 0.757 ac, 65.86% Impervious, Inflow Depth > 3.86" for 25-Year event
Inflow = 3.63 cfs @ 12.06 hrs, Volume= 0.243 af
Outflow = 2.99 cfs @ 12.12 hrs, Volume= 0.242 af, Atten= 18%, Lag= 3.4 min
Primary = 2.99 cfs @ 12.12 hrs, Volume= 0.242 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 170.50' @ 12.12 hrs Surf.Area= 5,397 sf Storage= 2,060 cf

Plug-Flow detention time= 27.6 min calculated for 0.242 af (100% of inflow)
Center-of-Mass det. time= 26.0 min (782.2 - 756.2)

Volume	Invert	Avail.Storage	Storage Description
#1	167.50'	177 cf	**5.00'W x 90.00'L x 1.00'H Stone Bed** 450 cf Overall - 8 cf Embedded = 442 cf x 40.0% Voids
#2	167.50'	8 cf	**4.0" D x 90.0'L Pipe Storage** Inside #1
#3	168.50'	363 cf	**Bio Media (Prismatic)** Listed below (Recalc) 2,418 cf Overall x 15.0% Voids
#4	170.00'	3,340 cf	**Open Pond Area (Irregular)** Listed below (Recalc)
		3,888 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
168.50	1,612	0	0
170.00	1,612	2,418	2,418

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
170.00	2,669	241.0	0	0	2,669
171.00	4,060	341.0	3,340	3,340	7,310

Device	Routing	Invert	Outlet Devices
#1	Primary	170.30'	**12.0' long x 4.0' breadth E. Spill Way** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Primary	167.50'	**4.0" Round 4" Outlet** L= 86.0' Ke= 0.500 Inlet / Outlet Invert= 167.50' / 167.25' S= 0.0029 '/' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=2.86 cfs @ 12.12 hrs HW=170.50' TW=0.00' (Dynamic Tailwater)
└─**1=E. Spill Way** (Weir Controls 2.51 cfs @ 1.06 fps)
└─**2=4" Outlet** (Barrel Controls 0.35 cfs @ 4.05 fps)

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Remainder of Area Runoff Area=56,252 sf 40.45% Impervious Runoff Depth>3.50"
Flow Length=245' Tc=2.6 min CN=83 Runoff=6.10 cfs 0.377 af

Subcatchment2S: Loading Dock Area Runoff Area=5,215 sf 100.00% Impervious Runoff Depth>4.97"
Flow Length=117' Tc=0.9 min CN=98 Runoff=0.74 cfs 0.050 af

Subcatchment3S: Parking Area Runoff Area=32,967 sf 65.86% Impervious Runoff Depth>4.32"
Flow Length=71' Tc=3.8 min CN=91 Runoff=4.07 cfs 0.272 af

Reach 5R: Trench Drain Avg. Flow Depth=0.67' Max Vel=4.03 fps Inflow=4.07 cfs 0.272 af
n=0.013 L=100.0' S=0.0050 '/' Capacity=4.73 cfs Outflow=4.04 cfs 0.272 af

Reach 100R: Northern Abutting Lands (Non Point Discharge) Inflow=9.42 cfs 0.697 af
Outflow=9.42 cfs 0.697 af

Pond 2P: Yard Drain Peak Elev=169.35' Inflow=0.74 cfs 0.050 af
12.0" Round Culvert n=0.012 L=108.0' S=0.0028 '/' Outflow=0.74 cfs 0.050 af

Pond 3P: Rain Garden Peak Elev=170.53' Storage=2,137 cf Inflow=4.04 cfs 0.272 af
Outflow=3.49 cfs 0.271 af

Total Runoff Area = 2.168 ac Runoff Volume = 0.698 af Average Runoff Depth = 3.87"
47.39% Pervious = 1.027 ac 52.61% Impervious = 1.141 ac

Summary for Subcatchment 1S: Remainder of Area Draining With No Treatment

Runoff = 6.10 cfs @ 12.04 hrs, Volume= 0.377 af, Depth> 3.50"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=5.60"

	Area (sf)	CN	Description
*	22,755	98	Roof
	11,459	70	Woods, Good, HSG C
*	22,038	74	>75% Grass cover, Good, HSG C Rain Garden
	56,252	83	Weighted Average
	33,497		59.55% Pervious Area
	22,755		40.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	100	0.4200	4.50		**Sheet Flow, 1** Smooth surfaces n= 0.011 P2= 3.00"
2.2	145	0.0255	1.12		**Shallow Concentrated Flow, 2** Short Grass Pasture Kv= 7.0 fps
2.6	245	Total			

Summary for Subcatchment 2S: Loading Dock Area

Runoff = 0.74 cfs @ 12.01 hrs, Volume= 0.050 af, Depth> 4.97"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=5.60"

	Area (sf)	CN	Description
	5,215	98	Paved parking, HSG C
	5,215		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0300	1.36		**Sheet Flow, 1** Smooth surfaces n= 0.011 P2= 3.00"
0.3	67	0.0270	3.34		**Shallow Concentrated Flow, 2** Paved Kv= 20.3 fps
0.9	117	Total			

Summary for Subcatchment 3S: Parking Area

Runoff = 4.07 cfs @ 12.06 hrs, Volume= 0.272 af, Depth> 4.32"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 50-Year Rainfall=5.60"

Area (sf)	CN	Description
21,711	98	Paved parking, HSG C
3,083	82	Woods/grass comb., Poor, HSG C
8,173	74	>75% Grass cover, Good, HSG C
32,967	91	Weighted Average
11,256		34.14% Pervious Area
21,711		65.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	12	0.0200	0.87		**Sheet Flow, 1** Smooth surfaces n= 0.011 P2= 3.00"
3.6	59	0.0930	0.27		**Sheet Flow, 2** Grass: Short n= 0.150 P2= 3.00"
3.8	71	Total			

Summary for Reach 5R: Trench Drain

Inflow Area = 0.757 ac, 65.86% Impervious, Inflow Depth > 4.32" for 50-Year event
Inflow = 4.07 cfs @ 12.06 hrs, Volume= 0.272 af
Outflow = 4.04 cfs @ 12.06 hrs, Volume= 0.272 af, Atten= 1%, Lag= 0.3 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.03 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.27 fps, Avg. Travel Time= 1.3 min

Peak Storage= 100 cf @ 12.06 hrs
Average Depth at Peak Storage= 0.67'
Bank-Full Depth= 0.75' Flow Area= 1.1 sf, Capacity= 4.73 cfs

1.50' x 0.75' deep channel, n= 0.013
Length= 100.0' Slope= 0.0050 '/'
Inlet Invert= 170.57', Outlet Invert= 170.07'

Summary for Reach 100R: Northern Abutting Lands (Non Point Discharge)

Inflow Area = 2.168 ac, 52.61% Impervious, Inflow Depth > 3.86" for 50-Year event
Inflow = 9.42 cfs @ 12.06 hrs, Volume= 0.697 af
Outflow = 9.42 cfs @ 12.06 hrs, Volume= 0.697 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Pond 2P: Yard Drain

Inflow Area = 0.120 ac,100.00% Impervious, Inflow Depth > 4.97" for 50-Year event
Inflow = 0.74 cfs @ 12.01 hrs, Volume= 0.050 af
Outflow = 0.74 cfs @ 12.01 hrs, Volume= 0.050 af, Atten= 0%, Lag= 0.0 min
Primary = 0.74 cfs @ 12.01 hrs, Volume= 0.050 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 169.35' @ 12.01 hrs
Flood Elev= 170.15'

Device	Routing	Invert	Outlet Devices
#1	Primary	168.80'	**12.0" Round Culvert** L= 108.0' Ke= 0.300 Inlet / Outlet Invert= 168.80' / 168.50' S= 0.0028 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.71 cfs @ 12.01 hrs HW=169.33' TW=0.00' (Dynamic Tailwater)
↑**1=Culvert** (Barrel Controls 0.71 cfs @ 2.40 fps)

Summary for Pond 3P: Rain Garden

Inflow Area = 0.757 ac, 65.86% Impervious, Inflow Depth > 4.32" for 50-Year event
Inflow = 4.04 cfs @ 12.06 hrs, Volume= 0.272 af
Outflow = 3.49 cfs @ 12.11 hrs, Volume= 0.271 af, Atten= 14%, Lag= 3.0 min
Primary = 3.49 cfs @ 12.11 hrs, Volume= 0.271 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 170.53' @ 12.11 hrs Surf.Area= 5,429 sf Storage= 2,137 cf

Plug-Flow detention time= 27.1 min calculated for 0.271 af (100% of inflow)
Center-of-Mass det. time= 25.5 min (779.5 - 753.9)

Volume	Invert	Avail.Storage	Storage Description
#1	167.50'	177 cf	**5.00'W x 90.00'L x 1.00'H Stone Bed** 450 cf Overall - 8 cf Embedded = 442 cf x 40.0% Voids
#2	167.50'	8 cf	**4.0" D x 90.0'L Pipe Storage** Inside #1
#3	168.50'	363 cf	**Bio Media (Prismatic)** Listed below (Recalc) 2,418 cf Overall x 15.0% Voids
#4	170.00'	3,340 cf	**Open Pond Area (Irregular)** Listed below (Recalc)
		3,888 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
168.50	1,612	0	0
170.00	1,612	2,418	2,418

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
170.00	2,669	241.0	0	0	2,669
171.00	4,060	341.0	3,340	3,340	7,310

Device	Routing	Invert	Outlet Devices
#1	Primary	170.30'	**12.0' long x 4.0' breadth E. Spill Way** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Primary	167.50'	**4.0" Round 4" Outlet** L= 86.0' Ke= 0.500 Inlet / Outlet Invert= 167.50' / 167.25' S= 0.0029 '/' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=3.39 cfs @ 12.11 hrs HW=170.52' TW=0.00' (Dynamic Tailwater)
1=E. Spill Way (Weir Controls 3.03 cfs @ 1.13 fps)
2=4" Outlet (Barrel Controls 0.35 cfs @ 4.07 fps)

Time span=5.00-20.00 hrs, dt=0.05 hrs, 301 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment1S: Remainder of Area Runoff Area=56,252 sf 40.45% Impervious Runoff Depth>4.12"
Flow Length=245' Tc=2.6 min CN=83 Runoff=7.12 cfs 0.443 af

Subcatchment2S: Loading Dock Area Runoff Area=5,215 sf 100.00% Impervious Runoff Depth>5.60"
Flow Length=117' Tc=0.9 min CN=98 Runoff=0.83 cfs 0.056 af

Subcatchment3S: Parking Area Runoff Area=32,967 sf 65.86% Impervious Runoff Depth>4.96"
Flow Length=71' Tc=3.8 min CN=91 Runoff=4.65 cfs 0.313 af

Reach 5R: Trench Drain Avg. Flow Depth=0.74' Max Vel=4.17 fps Inflow=4.65 cfs 0.313 af
n=0.013 L=100.0' S=0.0050 '/' Capacity=4.73 cfs Outflow=4.61 cfs 0.313 af

Reach 100R: Northern Abutting Lands (Non Point Discharge) Inflow=11.20 cfs 0.811 af
Outflow=11.20 cfs 0.811 af

Pond 2P: Yard Drain Peak Elev=169.38' Inflow=0.83 cfs 0.056 af
12.0" Round Culvert n=0.012 L=108.0' S=0.0028 '/' Outflow=0.83 cfs 0.056 af

Pond 3P: Rain Garden Peak Elev=170.55' Storage=2,227 cf Inflow=4.61 cfs 0.313 af
Outflow=4.09 cfs 0.312 af

Total Runoff Area = 2.168 ac Runoff Volume = 0.812 af Average Runoff Depth = 4.49"
47.39% Pervious = 1.027 ac 52.61% Impervious = 1.141 ac

Summary for Subcatchment 1S: Remainder of Area Draining With No Treatment

Runoff = 7.12 cfs @ 12.04 hrs, Volume= 0.443 af, Depth> 4.12"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.30"

	Area (sf)	CN	Description
*	22,755	98	Roof
	11,459	70	Woods, Good, HSG C
*	22,038	74	>75% Grass cover, Good, HSG C Rain Garden
	56,252	83	Weighted Average
	33,497		59.55% Pervious Area
	22,755		40.45% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.4	100	0.4200	4.50		**Sheet Flow, 1** Smooth surfaces n= 0.011 P2= 3.00"
2.2	145	0.0255	1.12		**Shallow Concentrated Flow, 2** Short Grass Pasture Kv= 7.0 fps
2.6	245	Total			

Summary for Subcatchment 2S: Loading Dock Area

Runoff = 0.83 cfs @ 12.01 hrs, Volume= 0.056 af, Depth> 5.60"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.30"

Area (sf)	CN	Description
5,215	98	Paved parking, HSG C
5,215		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	50	0.0300	1.36		**Sheet Flow, 1** Smooth surfaces n= 0.011 P2= 3.00"
0.3	67	0.0270	3.34		**Shallow Concentrated Flow, 2** Paved Kv= 20.3 fps
0.9	117	Total			

Summary for Subcatchment 3S: Parking Area

Runoff = 4.65 cfs @ 12.06 hrs, Volume= 0.313 af, Depth> 4.96"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Type III 24-hr 100-Year Rainfall=6.30"

Area (sf)	CN	Description
21,711	98	Paved parking, HSG C
3,083	82	Woods/grass comb., Poor, HSG C
8,173	74	>75% Grass cover, Good, HSG C
32,967	91	Weighted Average
11,256		34.14% Pervious Area
21,711		65.86% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.2	12	0.0200	0.87		**Sheet Flow, 1** Smooth surfaces n= 0.011 P2= 3.00"
3.6	59	0.0930	0.27		**Sheet Flow, 2** Grass: Short n= 0.150 P2= 3.00"
3.8	71	Total			

Summary for Reach 5R: Trench Drain

Inflow Area = 0.757 ac, 65.86% Impervious, Inflow Depth > 4.96" for 100-Year event
Inflow = 4.65 cfs @ 12.06 hrs, Volume= 0.313 af
Outflow = 4.61 cfs @ 12.06 hrs, Volume= 0.313 af, Atten= 1%, Lag= 0.3 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.17 fps, Min. Travel Time= 0.4 min
Avg. Velocity = 1.35 fps, Avg. Travel Time= 1.2 min

Peak Storage= 110 cf @ 12.06 hrs
Average Depth at Peak Storage= 0.74'
Bank-Full Depth= 0.75' Flow Area= 1.1 sf, Capacity= 4.73 cfs

1.50' x 0.75' deep channel, n= 0.013
Length= 100.0' Slope= 0.0050 '/'
Inlet Invert= 170.57', Outlet Invert= 170.07'

Summary for Reach 100R: Northern Abutting Lands (Non Point Discharge)

Inflow Area = 2.168 ac, 52.61% Impervious, Inflow Depth > 4.49" for 100-Year event
Inflow = 11.20 cfs @ 12.06 hrs, Volume= 0.811 af
Outflow = 11.20 cfs @ 12.06 hrs, Volume= 0.811 af, Atten= 0%, Lag= 0.0 min

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs

Summary for Pond 2P: Yard Drain

Inflow Area = 0.120 ac,100.00% Impervious, Inflow Depth > 5.60" for 100-Year event
Inflow = 0.83 cfs @ 12.01 hrs, Volume= 0.056 af
Outflow = 0.83 cfs @ 12.01 hrs, Volume= 0.056 af, Atten= 0%, Lag= 0.0 min
Primary = 0.83 cfs @ 12.01 hrs, Volume= 0.056 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 169.38' @ 12.01 hrs
Flood Elev= 170.15'

Device	Routing	Invert	Outlet Devices
#1	Primary	168.80'	**12.0" Round Culvert** L= 108.0' Ke= 0.300 Inlet / Outlet Invert= 168.80' / 168.50' S= 0.0028 '/' Cc= 0.900 n= 0.012, Flow Area= 0.79 sf

Primary OutFlow Max=0.80 cfs @ 12.01 hrs HW=169.37' TW=0.00' (Dynamic Tailwater)
↑**1=Culvert** (Barrel Controls 0.80 cfs @ 2.48 fps)

Summary for Pond 3P: Rain Garden

Inflow Area = 0.757 ac, 65.86% Impervious, Inflow Depth > 4.96" for 100-Year event
Inflow = 4.61 cfs @ 12.06 hrs, Volume= 0.313 af
Outflow = 4.09 cfs @ 12.11 hrs, Volume= 0.312 af, Atten= 11%, Lag= 2.6 min
Primary = 4.09 cfs @ 12.11 hrs, Volume= 0.312 af

Routing by Dyn-Stor-Ind method, Time Span= 5.00-20.00 hrs, dt= 0.05 hrs
Peak Elev= 170.55' @ 12.11 hrs Surf.Area= 5,466 sf Storage= 2,227 cf

Plug-Flow detention time= 26.7 min calculated for 0.312 af (100% of inflow)
Center-of-Mass det. time= 25.2 min (776.4 - 751.3)

Volume	Invert	Avail.Storage	Storage Description
#1	167.50'	177 cf	**5.00'W x 90.00'L x 1.00'H Stone Bed** 450 cf Overall - 8 cf Embedded = 442 cf x 40.0% Voids
#2	167.50'	8 cf	**4.0" D x 90.0'L Pipe Storage** Inside #1
#3	168.50'	363 cf	**Bio Media (Prismatic)** Listed below (Recalc) 2,418 cf Overall x 15.0% Voids
#4	170.00'	3,340 cf	**Open Pond Area (Irregular)** Listed below (Recalc)
		3,888 cf	Total Available Storage

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
168.50	1,612	0	0
170.00	1,612	2,418	2,418

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
170.00	2,669	241.0	0	0	2,669
171.00	4,060	341.0	3,340	3,340	7,310

Device	Routing	Invert	Outlet Devices
#1	Primary	170.30'	**12.0' long x 4.0' breadth E. Spill Way** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32
#2	Primary	167.50'	**4.0" Round 4" Outlet** L= 86.0' Ke= 0.500 Inlet / Outlet Invert= 167.50' / 167.25' S= 0.0029 '/' Cc= 0.900 n= 0.012, Flow Area= 0.09 sf

Primary OutFlow Max=4.04 cfs @ 12.11 hrs HW=170.55' TW=0.00' (Dynamic Tailwater)
└─**1=E. Spill Way** (Weir Controls 3.68 cfs @ 1.22 fps)
└─**2=4" Outlet** (Barrel Controls 0.36 cfs @ 4.09 fps)